DATA SHEET

Type 8418

bürkert
FLUID CONTROL SYSTEMS

RTD temperature sensor with IO-Link interface

- Single resistance thermometer Type Pt1000
- Process connections: G ½", clamp DN 10/20 according to DIN 32676
- Temperature measurement range: -50…+150 °C
- Available switching functions: PNP or NPN
- Access to measured value, device status and settings via IO-Link interface, very easy sensor replacement

Product variants described in the data sheet may differ from the product presentation and description.

Type description

The temperature sensor is used for measuring and monitoring the temperature. The impact of the temperature on a resistance thermometer generates a signal which is amplified, digitised and processed.

Instead of an analogue output, this device offers a digital interface IO-Link. This allows bidirectional data transfer with any IO-Link master. Data access occurs via the available standardised IODD.

The IO-Link corresponds to the specification version 1.1. The bidirectional communication is used to read process data, parameters, diagnostic information and status messages as well as to set parameters. The two green LEDs are permanently lit as soon as power is supplied to the device. Once an IO-Link connection has been established, the LEDs flash.

The switching behaviour and the switching thresholds of the digital outputs (max. 2; “PNP” or “NPN”) can - like many other parameters - be individually configured.

Use IO-Link
Universal · Smart · Easy

DTS 1000416970 EN Version: B Status: RL (released | freigegeben | validé) printed: 17.05.2023

Visit product website ▸

Table of contents

1. General technical data 3

2. Approvals 5

2.1. Pressure equipment directive 5
Device used on a pipe 5
Device used on a vessel 5

3. Materials 5

3.1. Chemical Resistance Chart – Bürkert resistApp 5

4. Dimensions 6

5. Ordering information 6

5.1. Bürkert eShop – Easy ordering and quick delivery 6
5.2. Bürkert product filter 7
5.3. Ordering chart 7

DTS 1000416970 EN Version: B Status: RL (released | freigegeben | validé) printed: 17.05.2023

1. General technical data

Product properties	
Material	
Make sure the device materials are compatible with the fluid you are using. Detailed information can be found in chapter "3.1. Chemical Resistance Chart – Bürkert resistApp" on page 5.	
Non wetted parts	
Housing	• Stainless steel 1.4404 (316L) for thread connection variant • Stainless steel 1.4571 (316Ti) for clamp connection variant
Circular connector	• Stainless steel 1.4404 (316L), PBT GF 6.5 for thread connection variant • Stainless steel 1.4571 (316Ti), PBT GF 6.5 for clamp connection variant
Wetted parts	
Process connection	• Stainless steel 1.4404 (316L) for thread connection variant • Stainless steel 1.4435 (316L) for clamp connection variant (with low delta ferrite content)
Protection tube	• Stainless steel 1.4404 (316L) for thread connection variant • Stainless steel 1.4435 (316L) for clamp connection variant
Dimensions	Detailed information can be found in chapter "4. Dimensions" on page 6.
Weight	Approx. 80 g for the variant with thread connection and 100 mm probe length. The weight of the temperature sensor depends on the process connection and the insertion length.
Measuring element	RTD temperature probe Pt1000, four-wire circuit
Measuring probe length	50 or 100 mm
Measuring range	-50…+150 °C (-58…+302 °F)
Monitoring	Measuring circuit: IO-Link event configurable and is available as device status • Process data invalid • Measuring range overflow • Measuring range underflow • Device hardware fault
Additional function	• Fine adjustment • Change between °C/°F • Data format switchover (integer/floating point) • Switching outputs in SIO mode
Performance data	
Sampling rate	160 ms
Transmission behaviour	Temperature linear
Measuring resolution	14 bit
Measurement deviation	• Tolerance class A, $\pm(0.15+0.002\times\lvert t\rvert^{1.)})$ °C according to EN 60751:2009/IEC 60751:2008 • ≤ ±(0.08 %)[2.] (calibration of the electronic components)
Response time	Protection tube Ø6 mm (standard): • $t_{0.5}$ = 5 s; $t_{0.9}$ = 12 s, in water with a flow velocity of 0.4 m/s • $t_{0.5}$ = 40 s; $t_{0.9}$ = 110 s, in air with a flow velocity of 3.0 m/s
Electrical data	
Operating voltage	• In IO-Link operation: 18…32 V DC, filtered and regulated • In switch operation: 9.6…32 V DC, filtered and regulated • Nominal voltage: 24 V DC
Power source (not supplied)	The auxiliary energy of the pressure sensor must meet SELV requirements; optionally, an energy-limited current circuit according to paragraph 9.3 of DIN EN 61010-1 and UL 61010-1 can be used
DC reverse polarity protection	Yes
Short circuit protection	Yes (clocked)
Protection class	Class III according to EN 61140
Current consumption	• In idle operation: ≤12 mA (at nominal voltage) • In IO-Link operation: ≤20 mA (at nominal voltage) • In switch operation: ≤200 mA (at nominal voltage and with 2 digital outputs)
Galvanic isolation	To the protection tube; no galvanic isolation between sensor and output

DTS 1000416970 EN Version: B Status: RL (released | freigegeben | validé) printed: 17.05.2023

Signal processing	Input filter: • digital filter, second order • filter time constant can be set
Output	
Number of outputs	• 1 digital output in IO-Link operation • 2 digital outputs for switch operation (SIO mode; SIO = standard IO)
Switching function configurable	• Hysteresis function (Hysteresis configurable) or window function (fixed setting, symetrical, ±0.25 % of the measuring range) • NC or NO contact • Digital output PNP or NPN • Switch-on/switch-off delay (0…100 s)
Measuring current	≤500 µA
Switching current	≤100 mA per output
Current limiting	Yes
Voltage drop at switching transistor	≤2 V DC
Recommended connection cable	4-wire unshielded cable, max. 20 m
Medium data	
Fluid	Liquid and gaseous medium
Fluid pressure	• G ½" process connection: Max. 40 bar • Clamp DN 10/20, according to DIN 3676. The permissible pressures are designed for an operating temperature range of -10 to +140 °C given use of suitable clamps and sealing materials.
Process/Port connection & communication	
Process connection	• G ½" according to EN 837 • Clamp DN 10/20 according to DIN 32676 Detailed information on the process connection can be found in chapter "5.3. Ordering chart" on page 7.
Electrical connection	M12×1 circular male connector, 4 pins, A-coded, non rotating (IO-Link Port Class A)
Digital communication: IO-Link	
Communication interface	IO-Link device V1.1, downward compatible to V1.0
Baud rate (data transfer rate)	COM 3 (230.4 kBaud)
Cycle time	Min. 2 ms
IO device description (IODD)	Depending on the ordered input range See "Device Description Files" on the website in the Software chapter **Type 8418** ▸ available or at **https://ioddfinder.io-link.com**
Approvals and certificates	
Directives	
CE directive	The applied standards, which verify conformity with the EU Directives, can be found on the EU Type Examination Certificate and/or the EU Declaration of conformity (if applicable).
Pressure equipment directive	• The device does not meet the requirements for "safety accessories" within the meaning of the Pressure Equipment Directive 2014/68/EU. • Complying with article 4, paragraph 1 of 2014/68/EU directive Detailed information on the pressure equipment directive can be found in chapter "2.1. Pressure equipment directive" on page 5.
Environment and installation	
Ambient temperature	Operation[3.] and storage: -40…+85 °C (-40…+185 °F)
Temperature influence	≤±0.0025 % per K[2.][4.]
Relative air humidity	• During operation: ≤100 %, without condensation on the outer housing surface of the device • During storage: ≤90 %, without condensation
Climate class	3K7 according to EN 60721-3-3
Application range	A
Degree of protection according to IEC/EN 60529	IP66/IP67/IP69 with connector screwed on
Mounting position	Unrestricted

1.) |t| = temperature value in °C regardless of the prefix sign.
2.) All accuracy specifications in % relative to the respective measuring range
3.) At process temperatures above 120 °C, the maximum admissible ambient temperature is 60 °C (stated at nominal voltage 24 V DC)

DTS 1000416970 EN Version: B Status: RL (released | freigegeben | validé) printed: 17.05.2023

4.) Relative to the temperature deviation at the calibration point (25 °C ±5 K)

2. Approvals

2.1. Pressure equipment directive

The device conforms to article 4, paragraph 1 of the pressure equipment directive 2014/68/EU under the following conditions:

Device used on a pipe

Note:

- The data in the table is independent of the chemical compatibility of the material and the fluid.
- PS = maximum admissible pressure (in bar), DN = nominal diameter of the pipe

Type of fluid	Conditions
Fluid group 1, article 4, paragraph 1.c.i	DN ≤ 25
Fluid group 2, article 4, paragraph 1.c.i	DN ≤ 32 or PS*DN ≤ 1000
Fluid group 1, article 4, paragraph 1.c.ii	DN ≤ 25 or PS*DN ≤ 2000
Fluid group 2, article 4, paragraph 1.c.ii	DN ≤ 200 or PS ≤ 10 or PS*DN ≤ 5000

Device used on a vessel

Note:

- The data in the table is independent of the chemical compatibility of the material and the fluid.
- PS = maximum admissible pressure (in bar), V = vessel volume

Type of fluid	Conditions
Fluid group 1, article 4, paragraph 1.a.i	V > 1 L and PS*V ≤ 25 bar.L or PS ≤ 200 bar
Fluid group 2, article 4, paragraph 1.a.i	V > 1 L and PS*V ≤ 50 bar.L or PS ≤ 1000 bar
Fluid group 1, article 4, paragraph 1.a.ii	V > 1 L and PS*V ≤ 200 bar.L or PS ≤ 500 bar
Fluid group 2, article 4, paragraph 1.a.ii	PS > 10 bar and PS*V ≤ 10000 bar.L or PS ≤ 1000 bar

3. Materials

3.1. Chemical Resistance Chart – Bürkert resistApp

Bürkert resistApp – Chemical Resistance Chart

You want to ensure the reliability and durability of the materials in your individual application case? Verify your combination of media and materials on our website or in our resistApp.

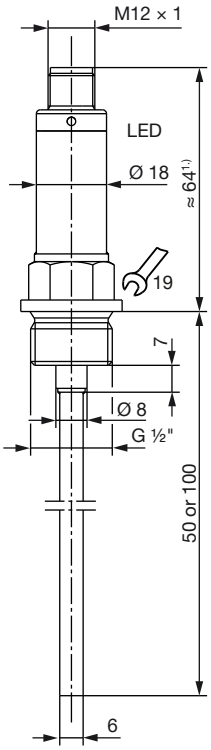
Start Chemical Resistance Check

DTS 1000416970 EN Version: B Status: RL (released | freigegeben | validé) printed: 17.05.2023

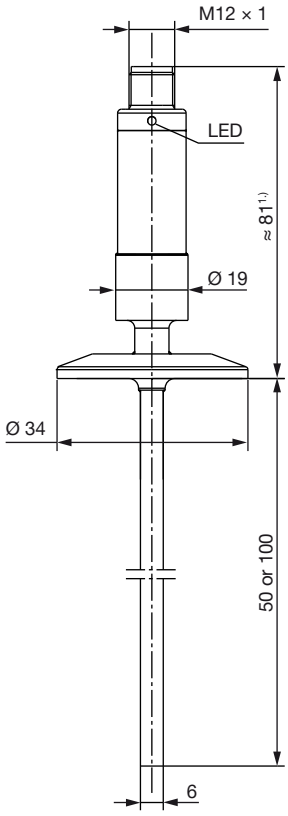
4. Dimensions

Note:
Dimensions in mm, unless otherwise stated

With G ½" process connection
according to EN 837



With clamp DN10/20 process connection
according to DIN 32676



1.) The total height is increased by the height of the used female connector and cable.

5. Ordering information

5.1. Bürkert eShop – Easy ordering and quick delivery

Bürkert eShop – Easy ordering and quick delivery

You want to find your desired Bürkert product or spare part quickly and order directly? Our online shop is available for you 24/7. Sign up and enjoy all the benefits.

Order online now

DTS 1000416970 EN Version: B Status: RL (released | freigegeben | validé) printed: 17.05.2023

5.2. Bürkert product filter

Bürkert product filter – Get quickly to the right product

You want to select products comfortably based on your technical requirements?
Use the Bürkert product filter and find suitable articles for your application quickly and easily.

Try out our product filter

5.3. Ordering chart

Note:
The following variants have

- an operating voltage depending on operation mode (IO-Link: 18…32 V DC, Switch: 9.6…32 V DC or Nominal: 24 V DC)
- an IO-Link digital interface (according to specification version 1.1) or digital outputs (SIO mode; SIO = standard IO)

Process connection	Temperature range [°C]	Probe length [mm]	Article no.
G ½" according to EN 837	-50…+150	50	574634
		100	574635
Clamp DN 10/20 according to DIN 32676		50	574636
		100	574637

Further versions on request

Process connection

- Screw-in thread G ⅜"
- Screw-in thread M12 x 1.5 and G ½" with CIP-compliant conical seal
- Aseptic screw-in thread DN 20, DN 25, DN 32, DN 40, DN 50 according to DIN 11864-1 form A
- Taper socket with union nut DN 10, DN 25, DN 32 according to DIN 11851 (dairy pipe fitting)
- Clamping socket (clamp) DN 10/20, DN 25/40 according to DIN 32676
- Clamping socket (clamp) DN 50 according to DIN 32676 (2" ISO 2852)
- Clamping socket (clamp) 2 ½" similar to DIN 32676
- Ball welding socket with threaded compression fitting
- Welding socket with CIP-compliant conical seal
- VARIVENT® connection DN 15/10, DN 32/25 or DN 50/40
- BioControl® D25, D50, D65 or D80

Temperature
-50…+260 °C (-58…+500 °F)

Electrical connection
IO-Link, M12 x 1 connector, high-temperature

Additional

- Pt1000 temperature sensor, four-wire circuit
- Class AA according to EN 60751:2009 / IEC 60751:2008
- With protection tube diameter 3 mm only with screw-in thread M12 x 1.5 with CIP-compliant conical seal
- Insertion length: 15, 20, 25 only with screw-in thread M12 x 1.5 with CIP-compliant conical seal or 150 mm

Certification

- Inspection certificate 3.1 DIN EN 10204 (material)
- Special calibration

DTS 1000416970 EN Version: B Status: RL (released | freigegeben | validé) printed: 17.05.2023

Bürkert – Close to You

For up-to-date addresses
please visit us at
www.burkert.com

DTS 1000416970 EN Version: B Status: RL (released | freigegeben | validé) printed: 17.05.2023